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⑤④ Preformed road marking.

⑤⑦ A preformed road marking suitable for heat bonding to the surface on which it is to be laid without the use of adhesive comprises a body of a thermoplastic material which can be thermoset more than once and incorporates a reinforcement in or on the body. The reinforcement may be in the form of individual strands, or mesh, or a film or coating selected so that the effectiveness of the marking is not impaired. Advantageously the reinforcement is removed, for example by melting, during laying to the surface.

The use of the reinforcement in the marking holds the marking together in the event of cracking or shattering and during handling and it enables sections of marking to be folded for packing and unfolded and laid with ease on arrival at the marking site.

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PREFORMED ROAD MARKING

The present invention relates to preformed road markings. The term "road marking" as used herein is to be interpreted as including markings for airport runways, car parks, recreation areas, oil rig decks, roofs, warehouse floors, and other suitable surfaces.

The use of preformed road markings is well known. Such markings may be made, for example, of a rigid plastic material such as P.V.C. sheeting or a thermoplastics material such as that disclosed in British Standard Specification No 3262, containing resin or rosin. Some of these preformed road markings, such as those disclosed in French patent Specification No 1175968 U.K. patent Specification No 1444926 and U.S. patent Specification No 3844669, are designed to be attached to the road surface by adhesive and the invention is not concerned with such markings. Others of the markings, such as that disclosed in British patent Specification No 2030586A, can be thermoset more than once and it is possible to attach such markings to the road surface by heat bonding, i.e. heating the thermoplastic marking to its melting point to create

a bond between the marking and the road surface for example with a blow torch. It is with these latter type of markings that the present invention relates.

A problem that can arise with these latter road markings is that they can shatter during transit or handling, particularly where the road marking is brittle. Thermoplastic markings of this kind are also liable to become distorted during handling. A further problem is that there is a practical limit of about 1 metre to the length of each marking and to construct, for example, a letter having a height greater than 1 metre a plurality of markings is required. With a complicated letter such as "W" as many as eight sections may be required which inevitably leads to problems in ensuring that the individual sections are correctly aligned.

The object of the invention is to mitigate these problems.

According to the present invention there is provided a preformed road marking suitable for heat bonding to a road surface comprising a body of a thermoplastic material that can be thermoset more than once and reinforcement incorporated into or onto the said body.

The reinforcement can either remain in the marking after laying or be removeable during heat-bonding to the road surface on which it is laid, and may comprise a plurality of individual strands, a mesh, a sheet of film or a coating. The material used can be synthetic material such as nylon or cotton, glass fibres, metal wire or metal foil.

When the reinforcement is applied to the upper surface it is preferably made of a material which on heat bonding is burnt or melted from the surface of the marking material. The reinforcement should produce little or no surface discoloration and does not impair the overall effectiveness of the marking. Where the reinforcement

remains in the marking it will be quickly worn away by passing traffic.

Alternatively, the reinforcement may be incorporated into the body of the marking material to be worn away as the marking is eroded. In such a case, the reinforcement will be chosen such that it does not constitute a hazard or in any way impair the effectiveness of the marking or its bonding to the road surface.

Where the reinforcement is in the form of crossed strands, for example a mesh, and lies on the lower surface of the marking the gaps left by the strands (or the gauge of the mesh) must be large enough so that the bonding between the road surface and the marking is not impaired, and small enough to provide adequate support for the marking. If the marking is to be bonded to the road surface by heat from above the marking, the form and material of the reinforcement must be chosen so that the bonding is not effected. Heat bonding can also be achieved by heating the underside of the marking. In this case it is not necessary for reinforcement in the marking or on the upper surface to be able to transmit the heat, provided that there is enough of the body thermoplastic material under the reinforcement to provide an adequate bond. Thus it would be possible to use metal foil, in one piece as well as cut out to form a mesh.

The thermoplastic material is preferably one containing a filler, aggregate, pigment and a thermoplastic resinous or rosinous binder. Optionally it may also contain reflective particles. Such a thermoplastic will usually not be flexible, but a flexible marking can be prepared using the disclosure of British Patent Specification No 2,030,586A (Application No 7923314). A marking that is flexible at room temperature can be advantageous when a continuous coil of road marking is to be prepared. Such a coil may be packed in a drum or the like and uncoiled on site prior to bonding to the road surface, or

may be dispensed from a mechanical dispenser. Long stretches of single or double white or yellow lines are used along extensive stretches of road way.

EXAMPLE 1

A thermosetting thermoplastic which can be melted after its first setting and will set again in a required shape is used. The thermoplastic material described in British Standard Specification No 3262 is suitable, optionally with the addition of a plasticiser such as vegetable oil for a flexible marking. The selected thermoplastic material or mixture is heated and formed into a sheet of required thickness on a conveyor, to be cut into the required shapes after it has cooled. The reinforcement is incorporated into or onto the sheet of thermoplastic material before it is cut.

A protective film lies on top of the conveyor and water from a water cooling system wets the film to prevent a permanent bonding between the hot thermoplastic material and the film. A layer of 5cm mesh of polypropylene or polyethylene material is laid on the film and the thermoplastic sets with the reinforcement incorporated on the bottom thereof. In some cases the mesh moves up into the thermoplastic material.

EXAMPLE 2

A thermoplastic material as described in example 1 is used, but the reinforcement material is applied to the upper surface of the sheet as it is setting. A film of polyethylene sheeting such as that sold under the trade name "Visqueen" is applied to the thermoplastic while it is sufficiently hot to form a good bond with the thermoplastic material. On laying the marking to the road surface the film is burnt off or melted and leaves a marking of thermoplastic material only, without visually effecting the road marking.

A reinforcement of individual strands or a mesh or any

other arrangement which provides longitudinal and lateral support, could be used in the same way on top of the marking. The material used must be one that melts without distorting the thermoplastic when heated if the marking is to be heat bonded from above. It should also not effect the colour or shape of the marking on bonding, or visibly impair the laid marking. A suitable mesh could be provided by stamping out a polyethylene sheet.

A temporary marking may be produced by using a non-deteriorating mesh, such that the thermoplastics material marking can be pulled up from the road surface on reheating up to the softening point and not to the melting point of the thermoplastic so that the marking remains solid and can be removed in one piece. Alternatively the gauge of the mesh can vary across the marking so that on heat bonding only the edges of the marking would adhere to the road surface.

Should the road marking material shatter or otherwise be broken, the reinforcement prevents the marking falling apart. Handling and packing are therefore facilitated. Moreover once the marking has been applied to the road the appearance is not impaired and the marking is not distorted. In hot weather the reinforcement enables the marking to be moved around on the road surface for positioning without distortion.

The reinforcement enables relatively large markings to be made in one piece. Where a marking is too large to be handled or packed conveniently, the marking material can be scored whilst leaving the reinforcement intact to serve as a hinge. The marking can then be folded to ease handling and packing and then unfolded on site to give the desired one piece marking. For example, a 10 metres strip may be hinged at one metre intervals and once on site may be unfolded and used as a whole or cut along one of the hinges to give a strip of the required length.

However, markings may also be made in two or more

sections. For example 4 metre and 6 metre arrows may be constructed from a standard hinged stem and completed by adding various arrow heads as necessary, the heads being hinged or not depending on their size.

WHAT WE CLAIM IS:-

1. A preformed road marking suitable for heat bonding to the surface on which it is to be laid without the use of adhesive and comprising a body of a thermoplastic material which can be thermoset more than once characterised in that a reinforcement is incorporated into or onto the said body.
2. A preformed road marking according to claim 1 characterised in that said reinforcement is removeable from the marking during heat bonding to the road surface.
3. A preformed road marking according to claim 1 or 2 characterised in that said reinforcement is in the form of strands of material along and across the body.
4. A preformed road marking according to any of claims 1 to 3 characterised in that said reinforcement is in the form of a mesh.
5. A preformed road marking according to claim 1 or 2 characterised in that said reinforcement is in the form of a film of material.
6. A preformed road marking according to claim 4 or 5 characterised in that said material is selected from i) polyethylene sheeting and ii) metal foil.
7. A preformed road marking material according to claim 4 characterised in that the material is selected from i) polypropylene, ii) polyethylene, iii) glass fibres iv) cotton and v) flexible metal wire.
8. A preformed road marking according to any of the preceding claims characterised in that the thermoplastic

material contains aggregate, filler, thermoplastic resinous or rosinous binder and a suitable pigment.

9. A preformed road marking substantially as herein described with reference to Example 1.
10. A preformed road marking substantially as herein described with reference to Example 2.